

Tenosynovial giant cell tumour- Diffuse-type: case report

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Abstract

We present the case of a 28 years old female with complaints of swelling and pain increasing with activity in her right calf and knee, with no pain at rest. On the examination of the patient there was a 10/10/5 cm tumoral mass from the posterior side of the hip, the infrapatellar region and posterior side of the right calf. Lachman, anterior drawer, posterior drawer, and medial and lateral stress tests were negative. Mc Murrey and Appley tests were also negative. The laboratory tests were normal. No abnormal findings were presented at the X-ray. The ultrasound and the computer tomography revealed the presence of solid tumour in the right calf. A multidisciplinary surgery team was formed from General Surgery and Vascular Surgery to perform, in one surgical session, the resection of the mass. The histopathological examination confirmed the diagnosis of tenosynovial giant cell tumour.

Keywords: Tenosynovial giant cell tumour, Giant cell tumour of tendon sheath, Pigmented villonodular synovitis

Introduction

Tenosynovial giant cell tumour, first described by Jaffe et al in 1941, is also known as pigmented villonodular synovitis [1]. This is a neoplasm derived from the synovium that causes recruitment of immune cells, specifically macrophages, leading to formation of a mass. These tumours are often classified by their growth pattern (localized or diffuse) and site (intra- or extra-articular) [2]. Localized form is usually seen in the palmar region of hand and is rarely seen in the leg. It is more common in women and the average age range is 30–50. Patients are usually presented with a painless, slowly growing mass.[3] In this case report, we aimed to present a very rare case of a surgically treated intra-articular giant cell tenosynovial tumour arising from the tenosynovial tissue of the knee joint of a 28-year-old female patient.

Case report

We present the case of a 28 years old female with complaints of swelling and pain increasing with activity in his right calf and knee. The patient had no pain at rest. On the examination of the patient there was a 10/10/5 cm size tumoral mass from the posterior side of the hip, the infrapatellar region and posterior side of the right calf. Lachman, anterior drawer, posterior drawer, and medial and lateral stress tests were negative. Mc Murrey and

Appley's tests were also negative. The laboratory tests were normal. No abnormal findings were found at the X-ray. The ultrasound performed revealed at 7 mm subcutaneous, a well-circumscribed mass, heterogeneous with hypoechogenic areas situated at the external side of the calf. The mass has central vascular signal with no sign of invasion of the popliteus artery of vein, with extension to the bone but without invasion. (Fig 1)

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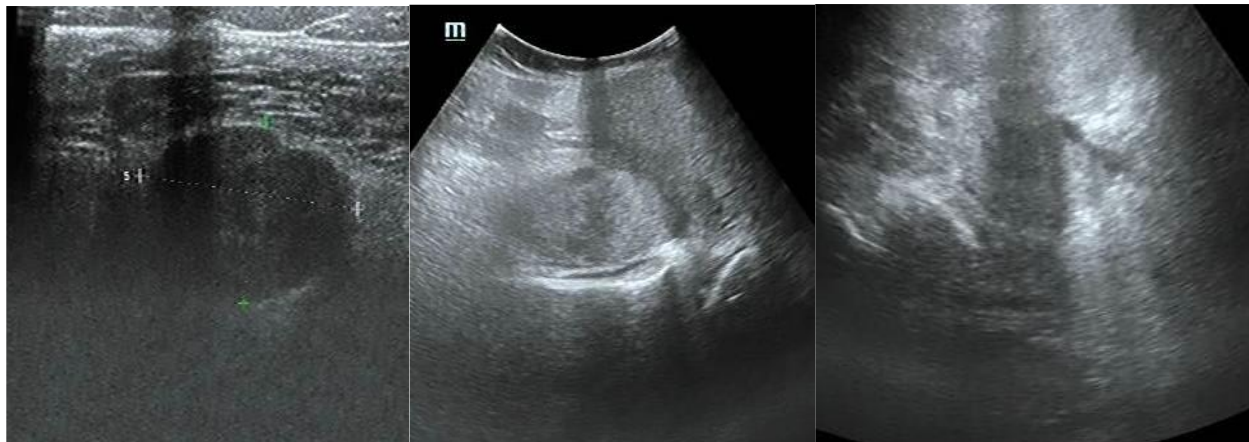


Fig 1. The well-circumscribed mass, heterogeneous with interior hypoechoic areas.

Radiologic features

We performed a CT instead of MRI because the patient had a left internal femoral rod. The CT revealed a heterogeneous mass, with a strong blood flow, with multiple smaller lobes and inside septums,

well-circumscribed, about 70/87/116 mm. This mass was on the topography of the popliteus muscle and the proximal edges of the soleus muscle, lateral to the gastrocnemius and the *flexor hallucis longus* muscle. The muscle tissue was atrophied due to compression. (Fig 2.)



Fig 2. The topography of the mass

The limits of the tumoral mass were:

- posterior and lateral faces of the external femoral condyle;
- external tibial plateau;
- proximal epiphysis of the fibula;
- proximal diaphysis of the tibia and the fibula without signs of invasion of these structures or of the knee joint; (Fig.3)

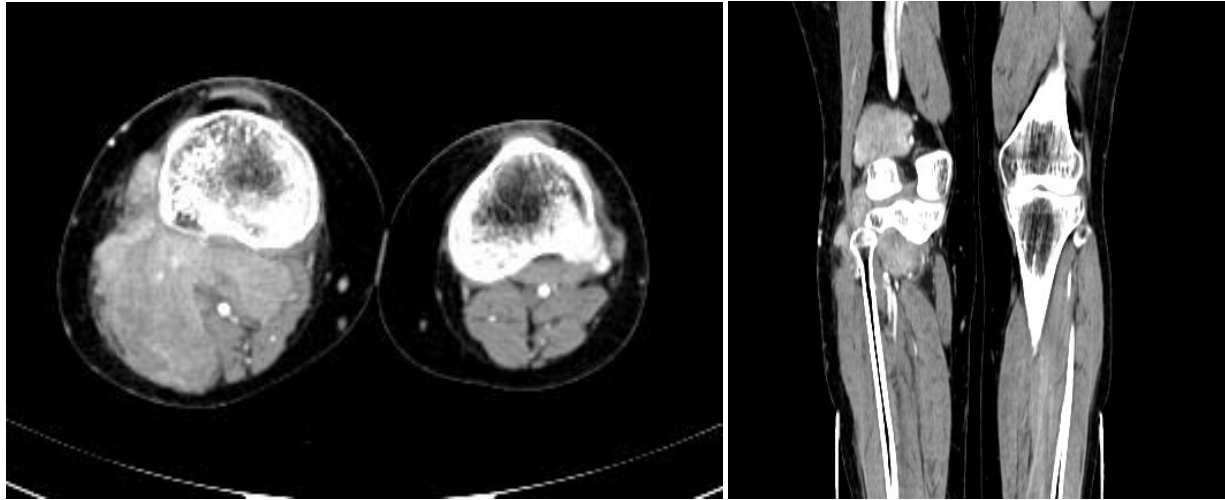


Fig 3. The limits of the tumoral mass

The mass surrounds the popliteus artery and vein without invasion, but makes the vein prolapse on 20 mm, with the dilatation of the profound veins in the posterior

lodge of the calf and the development of superficial venous circulation. The popliteus artery had no defect of calibration. (Fig.4)

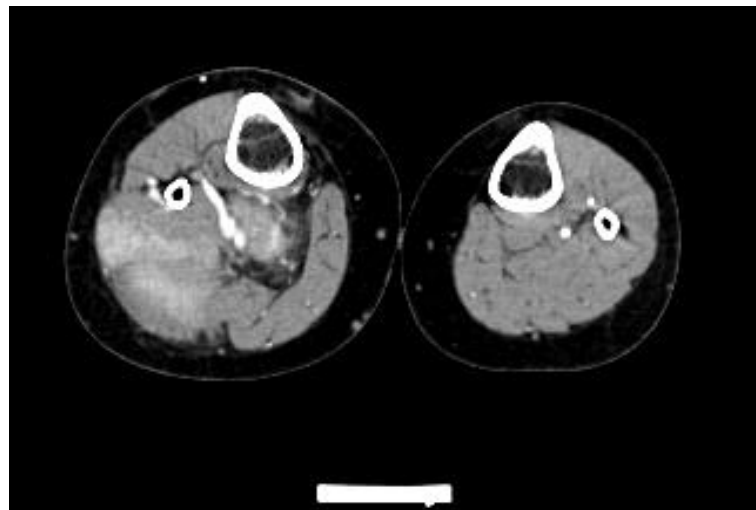


Fig 4. The relation of the mass with de popliteus artery and vein.

Surgical features

The surgical intervention was planned because the lesion was symptomatic. A multidisciplinary surgery team was formed from General Surgery and Vascular Surgery to perform in one surgical session the resection of the mass. The anaesthesiologist did the induction in the supine

position. After that the patient was positioned in the prone position. A “Z” incision was made from the posterior side of hip, popliteus region to the posterior upper calf. The tumoral mass was removed without incident or major bleeding, the vasculo-nervous structures were not damaged. (Fig.5)



Fig 5. The excision of the tumoral mass

Pathologic features

Giant cell tenosynovial tumour was diagnosed at the histopathological examination. The microscopic examination revealed histiocyte-like cells, some of them were epithelioid and fusiform type, with vesicular nucleus, amphiphilic cytoplasm and numerous osteoclast-like. The mitotic activity was low at 1-2 mitoses/10 Hpf. The stroma is rich vascularised with low inflammatory cell infiltration and multinucleated giant cells, sheets of xanthomas cells and hemosiderin-laden macrophages (Fig.6).

Immunohistochemically, the tumour focal expression was:

CKAE1/AE3-negative

S100-negative

Desmin-negative

MYO-D1-negative

CD68 -positive

Ki-67-5%

The final diagnosis was Tenosynovial giant cell tumour-diffuse type.

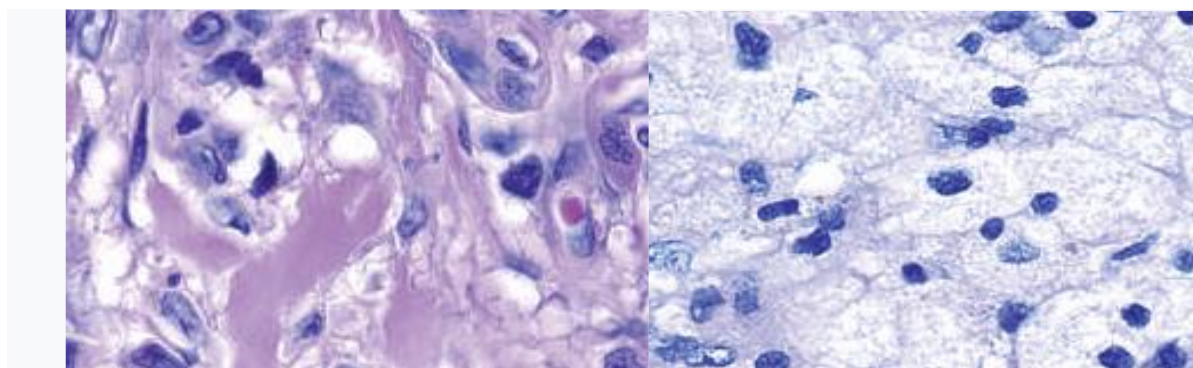


Fig 6. The histopathological examination.

After the intervention the patient had physical therapy to can help speed up post-surgical recovery. She didn't have limitation of function, disability or reduction of joint mobility and muscle strength.

The patient was asymptomatic at the 14th month control and recurrence was not detected.

Discussions

Tenosynovial giant cell tumours are benign soft tissue masses with intra-articular development arising from joint synovia, bursae and tendon sheaths. The literature cites two forms: localized and diffuse. Localized form includes giant cell tumours of tendon sheath and localized

pigmented villonodular synovitis, and diffuse type form is divided in pigmented villonodular synovitis and diffuse-type giant cell tumour.

Localized tumours are generally indolent, whereas diffuse tumours are locally aggressive.[4] Diffuse forms are mainly intra-articular, in the knee (75% of cases), hip, ankle or shoulder, although all synovial joints may be involved. [5]

Tenosynovial giant cell tumours of the knee is a rare pathology that has clinical signs and symptoms that can mimic a meniscal diagnostic or other common knee injuries. Symptom progression is slow, intervals between first signs and diagnosis are long: 10 months to 3 years. [6]

For the diagnosis standard radiography is indispensable, and is necessary as there are bone abnormalities. An MRI examination is indispensable to diagnosis and surgical planning because CT has insufficient soft tissue contrast resolution to evaluate the extent of the lesion. MRI is the modality of choice due to its ability to obtain detailed definition of the lesion and the extent of soft tissue and bone involvement. Localized forms typically show as a well-delineated lesion, off-centre from or else more-or-less completely enclosing the tendon in question. Diffuse forms are usually articular, showing as a soft-tissue mass with homogeneous uptake, with associated joint effusion. Fossa and extra-articular extension are often associated and should be screened for on preoperative work-up. The localized or diffuse lesion signal indicates the form of the tumour: variable tissue hemosiderin loading accounts for weak or intermediate signal on T1 and spin-echo T2-weighted sequences. The signal is enhanced on gadolinium injection. Gradient-echo sequences are very useful for detecting hemosiderin deposits, showing in low signal, even after injection.[7] Treatment is established by symptomatology and location of the tumoral mass. The primary treatment is the complete resection of the tumour. Radiation therapy is effective and targeted therapies are promising, both should especially be considered in case of relapse.[8]

The Armed Forces Institute of Pathology requires 5 out of 8 criteria to be considered malignant: diffuse pleomorphism, prominent nucleoli, high nuclear cytoplasmic ratio, mitoses of 10/10 Hpfs, necrosis, decohesion of cells, paucity of giant cells, and diffuse growth pattern.[9] Per Bertoni et al requires 6 criteria to be considered malignant: nodular lesions, infiltrative growth pattern, cells with large nuclei with eosinophilic cytoplasm and prominent nucleoli, and (fewer giant cells, xanthoma cells, and inflammatory cells, large plump or round to oval cells, lack of normal zonal patterns of maturation of tumoral mass, and areas of necrosis. Our histopathologic examination didn't have the required criteria to be considered malignant, but periodic check-up is still necessary. Clinical and surgical outcomes depend on multiple factors, including preoperative diagnostic assessment, the location and extent of disease, and possibly the choice of treatment modalities.[10]

Conclusions

In this case, the tumour was well circumscribed and easily removed by simple excision. Aside from its intra-articular location, it otherwise had the morphologic attributes of a giant cell tumour of tendon sheath. In particular, it was well circumscribed, multinodular, and encapsulated. This is an example of intra-articular, localized, like in other cases the diagnosis of malignant TGCT was not made until after histopathologic examination of the biopsied lesion, because of the low incidence of the lesion and the paucity of imaging of tenosynovial tumours in the literature.

Conflict of Interest

Authors have no conflict of interest to disclose

Ethical issues

The study was approved by the Ethics Commission of the University Hospital "St. Spiridon" Iasi

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